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State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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September 26, 2002

TO: Internal File

THRU: James Smith, Team, Senior Reclamation Specialist, Team Lead JPS

FROM: David Darby, Senior Reclamation Specialist

RE: Mill Fork Lease Extension of the Deer Creek Mine, Energy West Mining, PacifiCorp, Deer Creek Mine, C/015/018-PM01I-1

SUMMARY:

Energy West Mining Company submitted an application to mine the Mill Fork Lease Area, State Lease, ML-48258. The federal coal lease was traded to the State of Utah, for State leases in the Grand Staircase National Monument. The surface overlying the lease is U.S. Forest Service Lands. PacificCorp successfully acquired the Mill Fork lease and entered into a lease agreement with the State of Utah on April 1, 1999. The Mill Fork lease tract contains approximately 5,562.8 acres of land in East Mountain. The lease is proposed to be mined as an extension to the Deer Creek Mine.

This technical review evaluates the geological settings and impacts associated with mining of the Mill Fork lease tract. The Division received the initial application to add the Mill Fork permit extension to the Deer Creek Mine on October 29, 2001. A technical review was completed on January 31, 2002, which identified deficiencies. A second submittal was received on April 18, 2002.

TECHNICAL ANAYLSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Analysis:

The applicant provides geologic information describing the existing stratigraphy and structure of the Mill Fork Lease area, Section R645-301-600 Geology, Volume 12, of the amendment application. An environmental description is presented under 645-301-620. All proposed mining activity is underground, no surface activity is currently proposed for the Mill Fork Lease. The regional geology is also described in the hydrology section and again in the Probable Hydrologic Consequences Report prepared by Mayo and Associates.LLC as part of the Hydrology section. The geologic descriptions in the Hydrology section describe the relationship between the stratigraphy and structure and the movement, quantity and quality of water on and mear the Mill Creek proposed permit area.

The Mill Fork Lease encompasses an area of East Mountain a finger of the Wasatch Plateau. Its extent is shown on several maps in the PAP. Drawing MFU 48258 shows the lease in relationship to surface ownership and Drawing MFU 1837D shows the lease in relationship to adjacent leases. The lease lies between Huntington Canyon on the east and Joe's Valley, a graben valley, on the west. Genwal Resources Inc. control leases to the north, associated with the Crandall Canyon Mine. The Huntington #4 Mine , now reclaimed, lies east of the south eastern section of the lease. Energy West controls leases to the south, which are associated with the Deer Creek Mine. Coal extraction will take place in the Hiawatha (lower) and Blind Canyon (upper) coal seams. The extracted coal will be transported through mains to the Deer Creek Mine surface facilities.

The topographic features are presented on several maps and overburden isopach maps. Rilda Canyon, Millfork Canyon and Little Bear Canyon intersect the lease on the east. Two tributary canyons to Crandall Canyon intersect the lease on the north. At least five small canyons intersect the lease on the west. A ridgeline runs north-south down the western third of the property. The canyons are steep.

Several springs occur over the lease. The majority of springs appear above the Castlegate Sandstone. Little Bear Spring emanates east of the lease area. The flow from Little Bear Spring was studied by HGI/Water Technology and Research and studies by Mayo and Assoicates. Their conclusions identified the majority of flow emanating from the spring is recharge from the Mill Fork graben. Mayo and Associates conducted a dye test in 2001 and concluded that water in the Mill Fork drainage flows through fractures in the Star Point Sandstone to supply Little Bear Spring. Mining has been conducted in both the Deer Creek Mine and Beaver Creek #4 Mine that has intercepted the fault. The permittee plans to access the Mill Fork Lease by developing mains from the Deer Creek Mine to the Mill Fork Lease. The entries will cross the Mill Fork Fault. The plans for developing entries from the Deer Creek Mine to the Mill Fork Lease have been submitted and reviewed under a separate permit amendment. The applicant has address concerns related to groundwater interception and subsidence under that 67 acres permit amendment.

Findings:

The Permittee has submitted sufficient information to address the General section of the regulations.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

Drawing MFU-1837D identifies the proposed permit boundary, which is also identified as the lease area. Having identical boundaries for the permit and lease boundaries requires that all subsidence take place within the angle-of-draw so no effects occur outside the lease boundary. Joe's Valley Fault lies along the length of the western boundary. No secondary mining will take place beneath the fault. Drawing MFU-1829D indicates that the applicant plans to use a 22 degree angle of draw away from the Joes Valley fault.

The lease will be accessed from the Deer Creek Mine, which lies to the south-east. A 65.7 acre incidental boundary change, U-06039, will connect the Deer Creek Mine with the Mill Fork Lease area.

Findings:

The applicant has submitted sufficient information in the MRP to address the Permit Area section.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

The permittee provides geologic information associated with the Mill Fork Lease area in Section R645-301-600 Geology, Volume 12, of the amendment application. An environmental description is presented under 645-301-620.

A description of the regional geology, including stratigraphy and structure is presented in the PAP. A list of boreholes was submitted in Appendix B. The permittee collected geological information from boreholes and reports to identify the local geological setting. One representative lithologic log is presented in Appendix B. The permittee submitted a generalized cross-sectional map, Drawing MFU 1829D. It shows the a cross-sections of strata from north to south and east to west, no detailed information is shown, like fence diagrams identifying changes in the stratigraphic column or location of groundwater bearing zones between drill sites. The drawing and cross-section shows the Mill Fork graben cuts a surface layer of alluvium, Star

Point Sandstone and Mancos Shale in Mill Fork Canyon.

The permittee provides a table in Appendix C identifying the chemical analyses of roof, floor and coal seam for acid and toxic forming minerals. The samples were collected from the roof, floor and coal in the Blind Canyon and Hiawatha coal seams during a drilling program in the Mill Fork lease. Other samples identifying the chemical analyses of the roof, floor and coal were collected from the Blind Canyon and Hiawatha coal seam in the Deer Creek Mine. The analyses show a low sulfate, normal range for pH, calcium, boron and selenium levels.

The permittee discussed subsidence and subsidence control measures under Section R645-301-525, Volume 12 submittal. Pre-mining resources are identified on the Mill Fork Lease on Drawing MFS 1839D. The applicant also addresses the potential of impacts to the resources.

Findings:

The applicant has submitted sufficient information in the MRP to address the Geologic Resources Information section.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Alternative Water Source Information

The applicant needs to identify in the MRP the probable impacts to appropriated water resources on and adjacent to the lease (proposed permit area) and provide replacement plans for those appropriated water resources that are likely to sustain impacts subsidence as a result of coal mining in accordance with R645-301-525.120, 525.500, and 727, 731.530.

Probable Hydrologic Consequences Determination

A Probable Hydrologic Consequences report was compiled by Mayo and Associates for Energy West. The report is submitted in the Hydrology Section. The geologic information presented in the PAP is sufficient to establish the hydrologic activities and functions for a probable hydrologic consequence determination.

Findings:

R645-301-525.120, 525.500, 727, and 731.530. The applicant will describe how

appropriated water resources will be replaced in the event their flow is interrupted, diminished or contaminated from coal mining operations.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Affected Area Boundary Maps

The affected area boundary could extend north to the Crandall Canyon mine, west to the into Joes Valley, east to Huntington Creek. Deer Creek mine lies to the south where the same coal seams are being mined. Maps MFU-1824D, MFU-1825D, MFU-1826D, MFU-1827D and MFU-1828D provide geologic information to identify the affected area on and adjacent to the proposed Mill Fork permit area.

Coal resource and Geologic Information Maps

The applicant has submitted maps and tables identifying the local geologic and hydrologic features within and near the Mill Fork Lease Tract. Map MFU-1823D, the Geologic Formations Map shows the locations and elevations on the surface of all exploration drill holes and test wells within the lease area. Seventeen coal exploration holes and one gas well have been drilled within the lease area. The Utah Geological and Mineral Survey (Utah Geological Survey) drilled DH-2 in 1975. The U.S. Geological Survey drilled drill holes CLB-1, CLB-2, CLB-3A , SLB-1 and SLB-2 in 1980. ARCO Coal Company drill two holes, HC-2 and HC-3 in 1981. PacifiCorp drilled 9 boreholes to date within the lease, EM-169 through EM-177. Meridian Oil and Gas Co. drilled a single gas well on the property in 1987. Energy West used information from these drill holes and wells to assess the underground geology, coal reserves, ground-water resources and probable impacts to resources.

Map MFU-1823D, Geologic Formations Map, shows the locations and elevations of the surface of all exploration and drillholes and test wells within the permit area. Seventeen coal exploration holes and one gas well have been drilled within the lease tract.

There are two power lines on the lease. One line crosses a quarter section on the east side of the lease area. There is no planned mining beneath the line. The other line crosses the lease diagonally from south to west. It crosses over one panel. Two towers lie within the panel.

Existing Surface Configuration Maps

Existing surface configuration is portrayed in the Geologic Cross-sections maps MFU-1829D and Geologic Formations Map, MFU-1823D. The characteristics of the drainage pattern are a result of the surface configuration on the plateau. .

Mine Workings Maps

There has been some historic mining in the canyons east of the lease tract, but no mining has occurred within the Mill Fork Lease boundary.

Monitoring Sampling Location Maps

Several maps including Geologic Formations Map, MFU-1823D identify the locatons of boreholes from which geologic information and sampling was conducted.

Permit Area Boundary Maps

The permit area boundary is identified on several maps including maps MFU-1823D, MFU-1824D, MFU-1825D, MFU-1826D, MFU-1827D and MFU-1828D and MFU-1824D

Findings:

The applicant has submitted sufficient information to address the minimum of the Maps, Plans and Cross-sections requirements.

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

Analysis:

General

The applicant has submitted a local and regional description of the geology, including stratigraphy and structure. A list of boreholes was submitted in Appendix B. One representative lithologic log is presented in Appendix B. The permittee submitted a generalized cross-sectional map MFU 1829D showing a cross-section of strata from north to south and east to west, no detailed information is shown, like fence diagrams identifying changes in the stratigraphic column or location of groundwater bearing zones between drill sites. The drawing shows the Mill Fork graben cutting the Blackhawk Formation on the geologic map, but in the Star Point

Sandstone and Mancos Shale in the Cross-section.

The Mill Fork Lease encompasses an area of East Mountain. Its extent is shown on several maps in the PAP. Drawing MFU 48258 shows the lease in relationship to surface ownership. It lies between Huntington Canyon and Joe's Valley. Genwal Resources Inc. control leases to the north, associated with the Crandall Canyon Mine and Energy West control leases to the south, associated with the Deer Creek Mine. All mining activities in the Mill Fork Lease are planned underground. Coal extraction will take place in the Hiawatha (lower) and Blind Canyon (upper) coal seams. The extracted coal will be transported through mains to the Deer Creek Mine surface facilities.

Type and Method of Mining Operations

Drawings MFU-1824D through MFU-1828D identify room and pillar and longwall mining as the methods that will be conducted during this operation. Most of the mining in the Blind Canyon seam will take place in the northwest half of the lease. Drawing MFU-1824D identifies the thickness of the overburden above the Blind Canyon coal seam. Overburden thickness in the area of mining ranges from zero to 2600 feet. Most of the overburden thickness is over 1000 feet. The thinner overburden is in the northeast corner of the lease where a side canyon of Crandall Canyon, MFU-1825D, MFU-1826D, MFU-1827D and MFU-1828D.

Findings:

The applicant has submitted sufficient information to address the minimum Geologic Resource Information requirements.

COAL RECOVERY

Regulatory Reference: 30 CFR 817.59; R645-301-522.

Analysis:

The permittee describes coal recovery on p. 5-7. The permittee has planned mining operations to maximize the utilization and conservation of the coal. Both coal seams are minable over 50% or the Mill Fork lease.

The permittee will employ continuous and longwall mining methods. The mine layout for this lease is designed to mine large multi-seam areas. Mine layout for the Mill Fork Lease is illustrated on Maps MFU1840D and MFU1841D. In developing the maximum recovery plans, the permittee had to consider the amount of overlying strata above the coal seams and the amount of interburden between seams. Regulatory restrictions on mining, such as escarpment protection, barriers and perennial streams buffer zones were also evaluated and incorporated into

the PAP.

Structure contour maps of the Hiawatha coal seam , Drawing MFU-1828D and the Blind Canyon coal seam, MFU-1827D show contours of the dip structure and direction groundwater would likely follow.as it percolated down from strata above. The contours show that the dip moves away from the southeast corner of the lease, mostly toward the west. In the eastern half of the property the dip is north and then northeast. Both contour surfaces reveal a low curved arc between Genwal's Crandall Canyon Mine and the northern half of the lease. The syncline dips to the east then curves south to intersect the Mill Fork graben just south Little Bear Spring. The Mill Fork graben trends northeast from an area southwest of Mill Fork Canyon to little Bear Canyon then towards Huntington Creek.

All reports and studies identify the Mill Fork graben as part of the recharge source for Little Bear Spring. Surface flows in the creek infiltrate into the gravel in the vicinity of the graben, a volume currently reported as an average of about 300 gallons per minute

Energy West conducted a drilling program in Rilda Canyon to see if they could identify the faults of the Mill Fork graben. Information from the drilling showed the no significant offset of the faults in that area.

Findings:

The applicant has submitted sufficient information to address the minimum Coal Recovery Section of the regulations.

RECLAMATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Casing and sealing of wells

The permittee describes the casing and sealing of boreholes. Plans are to backfill or seal exploration holes or boreholes to prevent acid or toxic drainage from entering water resources, minimize disturbance in the permit and adjacent areas of the permit area. Boreholes will be

filled from total depth to the surface with type II Portland cement. If circulation cannot be maintained while filling the borehole will be filled with bentonite chips to within 5 feet of the top, then a cement surface plug with a permianent identification marker will be placed on the top of the hole.

Findings:

The applicant has submitted sufficient information to address the minimum Hydrologic Information requirements for this section.

RECOMMENDATION:

It is recommended that this application should not be approved until deficiencies noted above are addressed.

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Summary of Hydrological Reports

Hansen, Allen and Luce, Inc., March, 1997, Genwal Resources- Probable Hydrologic Consequences Evaluation of LBA 11.

Hansen, Allen and Luce conducted a review of the data and material to identify the probable hydrologic consequences of mining LBA 11 on Little Bear Spring and Rilda Canyon Spring. Main concern regarding potential mining impacts is a decrease or loss of water from springs.

A consistent continuous aquifer system is not found locally. Perched systems within the Castlegate and Blackhawk Formations provide small amounts of water to surface springs as water flows out to the edge of the confining geologic layer. Little contribution of water is believed to reach the underlying Starpoint Sandstone units.

Ancient channels or erosion beds are identified by in overlying strata can be breached from subsidence fracturing.

Faults conveying water such as the Joes Valley Fault and ftacture system,

Coal structure mapping confirms that the strata dips to the west toward Joes Valley fault within the entire western half of LBA 11.

Mayo and Assoc, March, 1997, Supplemental Hydrogeologic Information for LBA 11.

Vaugn Hansen Associates, August, 1977, Water Quality and Hydrologic Study in the Vicinity of Huntington, Creek Mine No. 4 and Little Bear Spring.

AquaTrack Survey, December, 1998, Little Bear Springs Study, Huntington Canyon, Utah.

AquaTrack Survey, December, 1999, Little Bear Springs Study, Huntington Canyon, Utah.

Sunshine Engineering, November, 2001, AquaTrack Survey- Little Bear Spring, Huntington, Utah.

Mayo and Assoc, January, 2001, Investigation of the Potential for Little Bear Spring Recharge in Mill Fork Canyon, Emery County, Utah.

Mayo and Assoc, November, 2001, Determination of the Recharge Location of Little Bear Spring by Means of Florescent Dye Tracing.

Mayo and Assoc. suggested in 1999 Little Bear Spring is recharged through surface water and/or alluvial groundwater losses in Middle Fork Canyon. In 1999 identified dye tracing was conducted on Little Bear Spring.